

# Honeywell

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*Representative photograph, actual product appearance may vary.*

*Due to regional agency approval requirements, some products may not be available in your area. Please contact your regional Honeywell office regarding your product of choice.*

## CSNX25

**CSN Series closed loop current sensor utilizing MR technology, measures AC, DC or impulse current, 25 amp-turns nominal,  $\pm 56$  amp-turns range, 2000 turn**

### Features

- Current sensing up to 1200 amps
- Measures ac, dc and impulse currents
- Competitive cost/performance ratio
- Rapid response
- High overload capability
- High level of electrical isolation between primary and secondary circuits
- Industrial operating temperature range
- Small size and weight

### Typical Applications

- Variable speed drives
- Overcurrent protection
- Ground fault detectors
- Current feedback control systems
- Robotics
- UPS and telecommunication power supplies
- Welding power supplies
- Automotive - Battery management systems
- Wattmeters

### Description

The CSN Series of closed loop current sensors are based on the principles of the Magnetoresistive or Hall effects, and the null balance or zero magnetic flux method (feedback system). The magnetic flux in the sensor core is constantly controlled at zero. The amount of current required to balance zero flux is the measure of the primary current flowing through the conductor, multiplied by the ratio of the primary to secondary windings. This closed loop current is the output from the device and presents an image of the primary current reduced by the number of secondary turns at any time. This current can be expressed as a voltage by passing it through a resistor.

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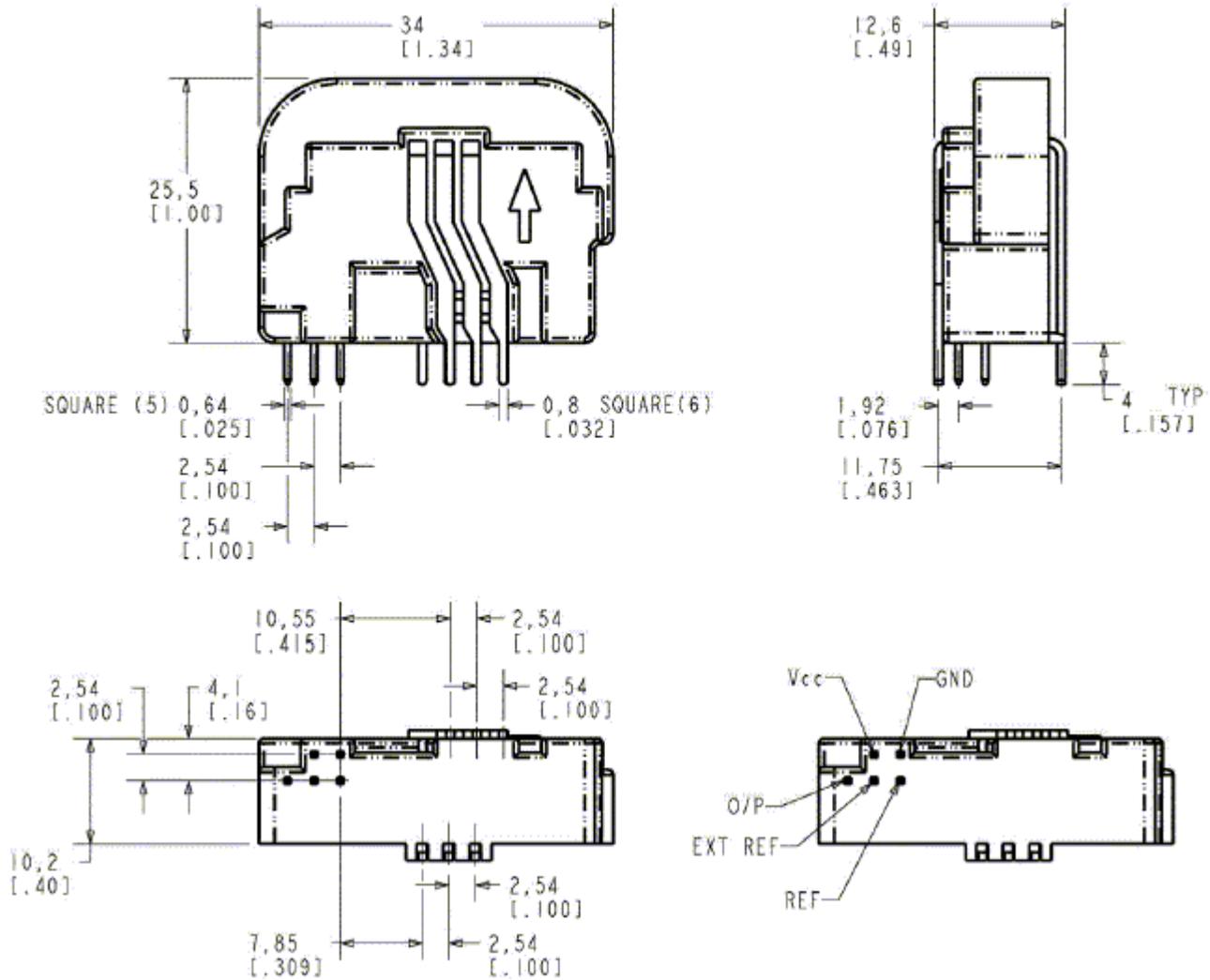
<b>Product Specifications</b>	
<b>Sensor Type</b>	Closed Loop Linear
<b>Sensed Current Type</b>	ac or dc
<b>Sensed Current Range</b>	$\pm 56$ A
<b>Package Style</b>	Series Connect PCB Mount
<b>Output Type</b>	Current
<b>Maximum Continuous Current</b>	$\pm 40$ A
<b>Supply Current</b>	$\pm 12$ mA + output
<b>Supply Voltage</b>	4.75 Vdc to 5.25 Vdc
<b>Offset Current</b>	$< \pm 0.03$ mA
<b>Offset Current Drift</b>	$< \pm 0.01$ mA
<b>Coil Resistance @ 70 °C</b>	50 Ohm
<b>Response Time</b>	$< 0.2$ $\mu$ s
<b>Coil Turns</b>	2000
<b>Output Nominal</b>	12.5 mA
<b>Operating Temperature Range</b>	-40 °C to 85 °C [-40 °F to 185 °F]
<b>Storage Temperature Range</b>	-40 °C to 90 °C [-40 °F to 194 °F]
<b>Minimum Measuring Resistance</b>	0 Ohm
<b>Maximum Measuring Resistance</b>	80 Ohm
<b>Housing Material</b>	Glass-filled Polyamide (UL94-V0)
<b>Mounting</b>	PCB on 11 pins
<b>Pinout Style</b>	Unipolar
<b>Accuracy</b>	$\pm 0.24$ %
<b>Availability</b>	Global
<b>Comment</b>	Unipolar supply sensor incorporating patented magnetoresistive sensing technology to achieve ultra-low offset drift with temperature.
<b>UNSPSC Code</b>	411121
<b>UNSPSC Commodity</b>	411121 Transducers
<b>Series Name</b>	CSN Series



# CSNX25

CSN Series closed loop current sensor utilizing MR technology, measures AC, DC or impulse current, 25 amp-turns nominal, ± 56 amp-turns range, 2000 turn

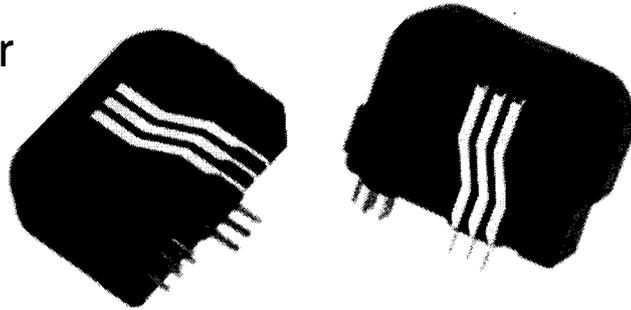
## Mounting drawing in mm and [inches]



# CSNX25

CSN Series closed loop current sensor utilizing MR technology, measures AC, DC or impulse current, 25 amp-turns nominal, ± 56 amp-turns range, 2000 turn

## CSN Series Magnetoresistive (MR) Closed Loop Current Sensor



### Features

- Ultra low offset drift with temperature
- Unipolar voltage supply
- Superior global accuracy over temperature range -40 °C to 85 °C
- Customer adjustable gain
- Customer accessible voltage reference
- Self calibrating
- Designed for auto assembly
- Current output

### Typical applications

- Servo drives
- Variable speed drives
- Frequency converters
- Power supply systems
- Over current protection
- Uninterruptible power supplies UPS
- Power metering

The CSN Series MR current sensor builds on patented Honeywell technology to offer superior sensor performance and accuracy in current measuring applications.

The current sensor utilises an ASIC (Application Specific Integrated Circuit) and a magnetoresistive (MR) Honeywell magnetic sensor to provide extremely low offset drift with temperature resulting in stable, repeatable, accurate measurements. This is achieved by using an ASIC to exploit the unique features of the MR sensor. There is virtually no offset drift over the entire operating temperature range.

The sensor operates from a +5 V unipolar supply and has an accessible, internal 2.5 V voltage reference. The sensor can operate from either the internal voltage reference or an external voltage reference, thus enabling several sensors to be used without offset imbalance. Three primary pins enable the sensor to be configured for different measuring ranges and the current output signal enables different load resistors to be used depending on the application.

The sensor offers flexibility and performance to meet many applications.



### WARNING

#### PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices, or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**



### WARNING

#### MISUSE OF DOCUMENTATION

- The information presented in this product sheet (or catalogue) is for reference only. DO NOT USE this document as product installation information.
- Complete installation, operation and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

# CSN Series MR Current Sensor

## Technical information

Supply voltage is +5 V and temperature is 25 °C unless otherwise stated

### Electrical

Nominal current (I <sub>n</sub> )	25 A.t rms		
Measuring range	0 to ± 56 A.t <sup>[1]</sup>		
Measuring resistance <sup>[2]</sup> with +5 V		R <sub>m</sub> min.	R <sub>m</sub> max.
	@ ± 25 A.t rms	0 Ohm	80 Ohm
	@ ± 40 A.t rms	0 Ohm	31 Ohm
Nominal analogue output current	12.5 mA rms		
Turns ratio	1-2-3/2000		
Accuracy <sup>[3]</sup> @ 25 °C	max. ± 0.24 % @ I <sub>n</sub>		
	@ -40 °C to 85 °C	max. ± 0.32 % @ I <sub>n</sub>	
Supply voltage	+5 Vdc (± 5 %)		
Internal reference voltage	+2.5 Vdc (± 10 mV)		
Galvanic isolation	5.0 kV rms/50 Hz/1 minute		

### Accuracy - dynamic performance

Zero offset current at 25 °C	< ± 30 µA	(= 0.24 % of 25 A)
Thermal drift of offset current 10 °C to 50 °C	< ± 5 µA	(= 0.04 % of 25 A)
Thermal drift of offset current -40 °C to 85 °C	< ± 10 µA	(= 0.08 % of 25 A)
Linearity	< ± 0.1 %	
Response time @ 90 % of pulse amplitude	< 200 ns	
di/dt accurately followed	> 100 A/µs	
Bandwidth (-1 dB)	dc to 200 kHz	

### General data

Operating temperature	-40 °C to 85 °C
Storage temperature	-40 °C to 90 °C
Current consumption	12 mA (+5 V) plus output current
Secondary internal resistance (@ 70 °C)	50 Ohm
Positive primary current	In direction of arrow
Sensor housing	Glass-filled Polyamide (UL94-V0)
Approvals	EN 50082-2, EN 50081-2, UL, CE
Rated insulation voltage (RIV)/Insulation classification	400 V reinforced
Dimensions [ L x W x H ] ( mm )	34 x 12,6 x 25,5
Construction	Fully encapsulated
Environment	Pollution degree 2, Category III
Fastening	PCB mounted sensor
Weight	20 g
Connection to primary	Via 6 x 0,8 mm square pins
Connection to secondary	Via 5 x 0,64 mm square pins

### Notes

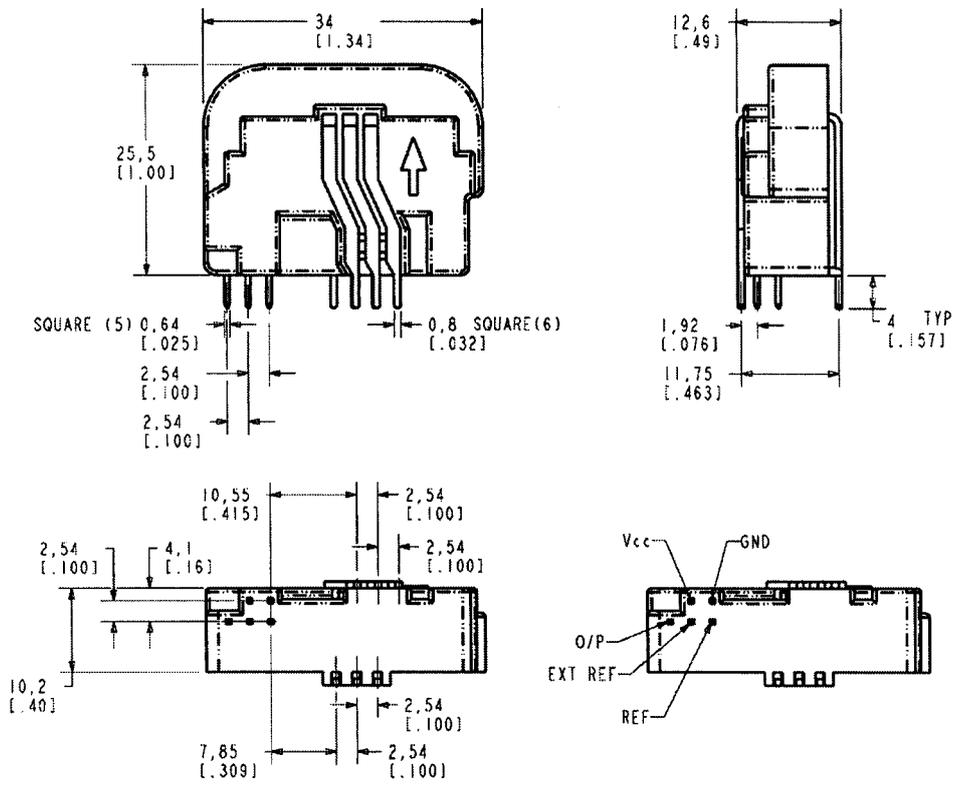
<sup>[1]</sup> ac peak. Maximum dc or ac rms range is 40 A.t.

<sup>[2]</sup> Higher resistance (R<sub>m</sub>) values can be used with reduced measuring range. Specified values conditional on 70 °C ambient and no power supply tolerance.

<sup>[3]</sup> Excludes the effects of tolerances of reference voltage and external load resistance.

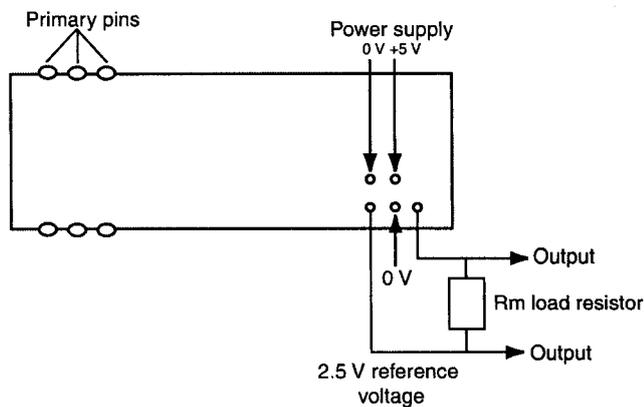
# CSN Series MR Current Sensor

## Mounting drawing in mm and [inches]

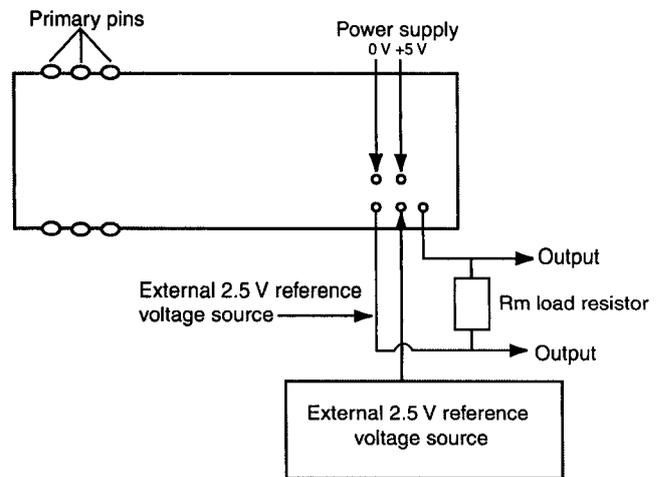


## Electrical wiring diagram

### Internal voltage reference mode



### External voltage reference mode

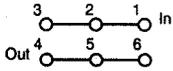
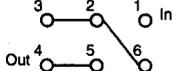
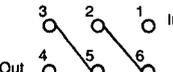


## Order guide

**Description**  
25 A MR current sensor

**Listing**  
CSNX25

## Primary pin connections (3 turns)

Primary turns	Primary Current		Nominal output (mA)	Primary pin connection
	Nom $I_{pn}$ (A)	Max $I_p$ (A)		
1	25	56	12.5	
2	12	27	12	
3	8	18	12	

### Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective material and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during that period of coverage, Honeywell will repair or replace without charge those items it finds defective. **The foregoing is Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.**

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Specifications may change at any time without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

### Sales and Service

Honeywell serves its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or name of the nearest Authorised Distributor, contact your local sales office or:

#### TELEPHONE:

International: 1-815-235-6847  
 USA: 1-815-537-6945  
 Europe: +44 (0)1698 481 481  
 Asia Pacific: +65 6355-2828  
 Latin America: 1-305-805-8188

#### E-MAIL:

mr.marketing@honeywell.com

#### INTERNET:

www.honeywell.com/sensing

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#### Sensing and Control

[www.honeywell.com/sensing](http://www.honeywell.com/sensing)

Honeywell Control Systems Ltd  
 Newhouse Industrial Estate  
 Motherwell, Lanarkshire ML1 5SB  
 Scotland, UK

DO NOT SCALE PRINT  
A3 FORMAT

CATALOGUE LISTING  
CSNX25-001  
F.W. BELL PART NUMBER  
CMR-25

ISSUE  
1

DRAWN I. WEIR  
CHECK  
DESIGN  
AUTHOR 'N

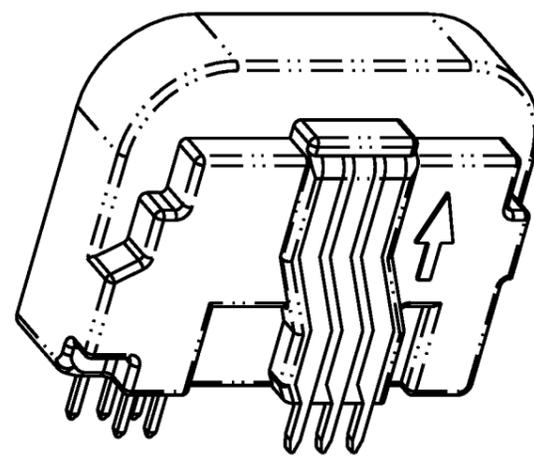
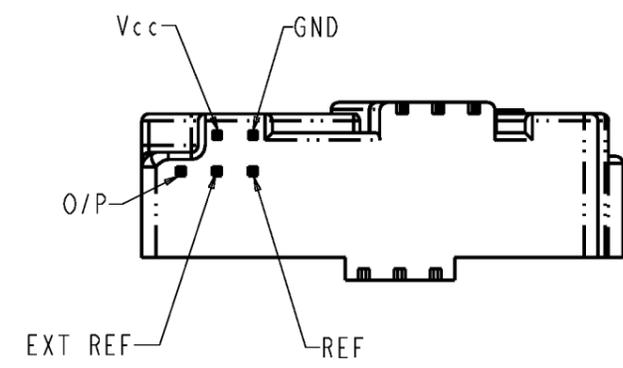
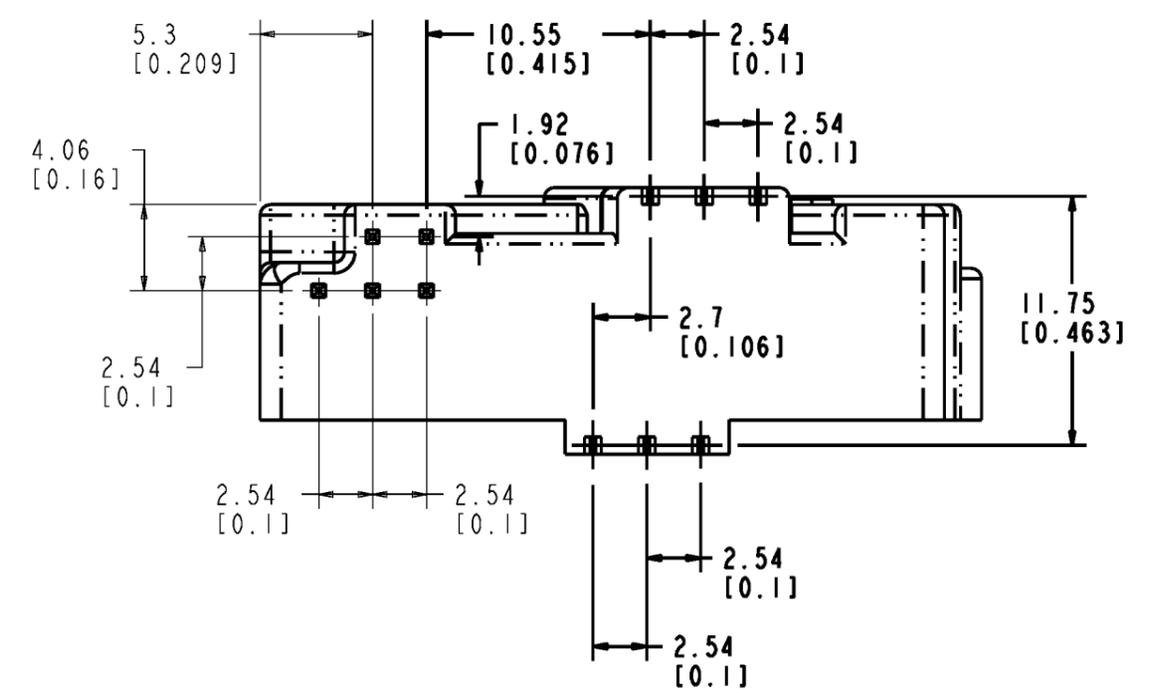
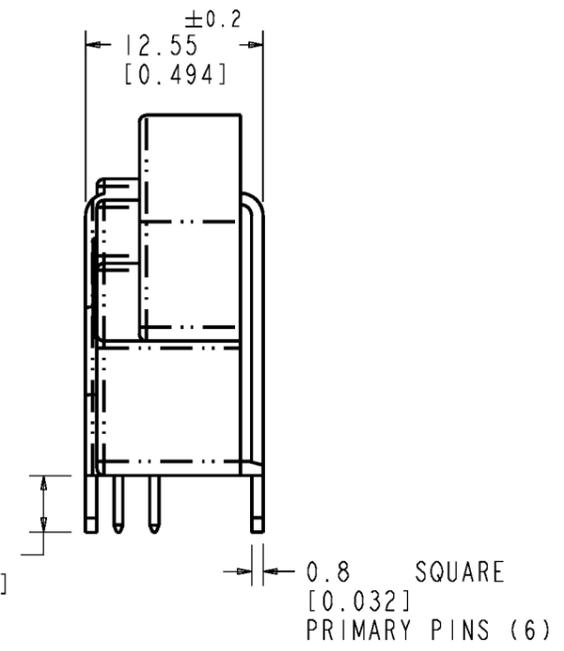
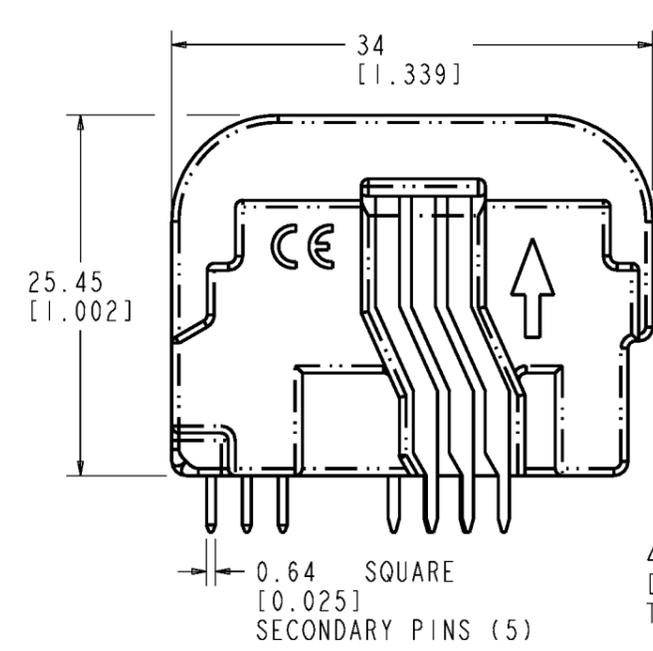
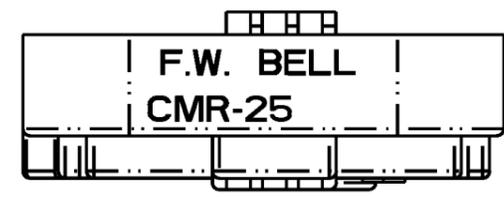
**Honeywell**

**NULL BALANCE CURRENT SENSOR**

CATALOGUE LISTING **CSNX25-001**  
F.W. BELL PART NUMBER **CMR-25**

APPROVALS  
**CE** **RU**®  
C US

SUPPLY VOLTAGE	NOM.	SENSING RANGE		OUTPUT NOMINAL	MAXIMUM COIL RESISTANCE AT 70°C	No. OF TURNS
		MAX (RMS)	MAX (AC PEAK)			
+5V ±5%	25A	40A	56A	12.5mA	50Ω	2000



**NOTES:-**

- FOR INTERNAL 2.5V REFERENCE MODE 'EXT REF' PIN MUST BE CONNECTED TO GND.
- FOR EXTERNAL 2.5V REFERENCE VOLTAGE MODE - APPLY VOLTAGE IN THE RANGE +1.0V TO +3.0V TO THE 'EXT REF' PIN.
- HOUSING MATERIAL:- GLASS FILLED POLYAMIDE. FULLY ENCAPSULATED CONSTRUCTION.

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THIRD ANGLE PROJECTION

MODIFY ON PROE SYSTEM ONLY

DIMENSIONS ARE IN MILLIMETRES (INCHES)

SCALE :- 2/1

TOLERANCES UNLESS OTHERWISE STATED

±0.2

